

APPENDIX D

PAMS Monitoring Implementation Network Plan Monitoring Organizations Required to Operate at NCore Sites

SCAQMD operates 6 Photochemical Assessment Monitoring Stations (PAMS) sites in the current air monitoring network. PAMS sites are located at the LAX Hastings, Azusa, Los Angeles (Main Street), Pico Rivera, Rubidoux and Santa Clarita sites. Changes to the SCAQMD PAMS network will be implemented by June 1, 2019.

Network Locations

The NCore sites located at Los Angeles (Main Street) and Rubidoux, will serve as the required PAMS sites and will measure the following parameters described below. An Inventory of equipment used at the site(s) is provided as Attachment 1.

Auto GC

Volatile Organic Compounds (VOCs) – A complete list of the targeted compounds are found in Table 1. SCAQMD will measure hourly speciated VOC measurements with an auto-gas chromatograph (GC) using an Agilent/Marke model 7890A/Unity Air Server 2.

Meteorology Measurements

SCAQMD will measure wind direction, wind speed, temperature, humidity, atmospheric pressure, solar radiation, ultraviolet radiation, and mixing height. SCAQMD has elected to use the following instrumentation to measure the parameters described above: RM Young 5305VP anemometer, Rotronic HC2-S3 ambient temperature/humidity, Vaisala PTB 110 barometer, Kipp and Zonen CMP6 Pyranometer, Eppley TUVB Total Ultraviolet Radiometer, and Vaisala CL51 Ceilometers.

SCAQMD requests waivers to allow precipitation and mixing height measurements to be obtained/measured from nearby sites. Rationale for this request is provided in the waiver attachment.

Other Measurements

Carbonyls – SCAQMD will monitor Carbonyls at a frequency of three 8-hour samples on an one in-three day basis during the months of June, July and August (~90 samples per PAMS sampling season) using ATEC model 8000 Automated Sampler. A complete list of the target carbonyl compounds may be found in Table 1. The TO-11A test method, as used in the National Air Toxics Trends (NATTS) program will be used.

Nitrogen Oxides – SCAQMD will monitor for NO and NO_y (total oxides of nitrogen) in addition to true NO₂. The true NO₂ is measured with a direct reading NO₂ analyzer, cavity attenuated phase shift (CAPS) spectroscopy. SCAQMD has elected to use Teledyne CAPS T500U for the true NO₂ measurement. NO and NO_y will be measured using a Thermo 42i or Thermo 42i-Y.

Table 1 PAMS Target Compound List^a

Priority Compounds				Optional Compounds			
1	1,2,3-trimethylbenzene ^a	19	n-hexane ^b	1	1,3,5-trimethylbenzene	19	m-diethylbenzene
2	1,2,4-trimethylbenzene ^a	20	n-pentane	2	1-pentene	20	methylcyclohexane
3	1-butene	21	o-ethyltoluene ^a	3	2,2-dimethylbutane	21	methylcyclopentane
4	2,2,4-trimethylpentane ^b	22	o-xylene ^{a,b}	4	2,3,4-trimethylpentane	22	n-decane
5	Acetaldehyde ^{b,c}	23	p-ethyltoluene ^a	5	2,3-dimethylbutane	23	n-heptane
6	acetone ^{c,d}	24	Propane	6	2,3-dimethylpentane	24	n-nonane
7	benzene ^{a,b}	25	propylene	7	2,4-dimethylpentane	25	n-octane
8	c-2-butene	26	styrene ^{a,b}	8	2-methylheptane	26	n-propylbenzene ^a
9	ethane ^d	27	toluene ^{a,b}	9	2-methylhexane	27	n-undecane
10	ethylbenzene ^{a,b}	28	t-2-butene	10	2-methylpentane	28	p-diethylbenzene
11	Ethylene			11	3-methylheptane	29	t-2-pentene
12	formaldehyde ^{b,c}			12	3-methylhexane	30	α/β-pinene
13	Isobutane			13	3-methylpentane	31	1,3 butadiene ^b
14	Isopentane			14	Acetylene	32	benzaldehyde ^c
15	Isoprene			15	c-2-pentene	33	carbon tetrachloride ^b
16	m&p-xylenes ^{a,b}			16	cyclohexane	34	Ethanol
17	m-ethyltoluene ^a			17	cyclopentane	35	Tetrachloroethylene ^b
18	n-butane			18	isopropylbenzene ^b		

Source: Revisions to the Photochemical Assessment Monitoring Stations Compound Target List.U.S. EPA, November 20, 2013

^a Important SOAP (Secondary Organic Aerosols Precursor) Compounds

^b HAP (Hazardous Air Pollutant) Compounds

^c Carbonyl compounds

^d Non-reactive compounds, not considered to be VOC for regulatory purposes

Attachment 1

Waiver Requests and Rationale

Meteorological Waiver Request

SCAQMD requests waivers to allow upper air meteorological and precipitation measurements to be measured and obtained at sites other than Los Angeles (Main Street) and Rubidoux.

Rationale for Waiver

SCAQMD currently operates upper air meteorological monitoring equipment at Los Angeles International Airport (LAX), Ontario International Airport (ONT), Moreno Valley (MOV), Moreno Valley Municipal Water Treatment Plant in Riverside County, Irvine (IRV) University of California Research and Extension Center, and Pacoima at Whiteman Airport (WHP) as part of the PAMS program. Because the physical location of the NCore sites at Los Angeles (Main Street) and Rubidoux are less suitable for meteorological measurements due to physical surroundings, SCAQMD requests a waiver to continue monitoring upper air utilizing ceilometers at LAX and ONT.

Precipitation measurements are not currently measured at the Los Angeles (Main Street) and Rubidoux air monitoring sites due to physical surroundings at the monitoring locations and the presence of other suitable measurements nearby. SCAQMD requests a waiver to utilize nearby precipitation measurements from the precipitation network maintained by the National Weather Service and the Federal Aviation Administration, including sites at Downtown Los Angeles (USC) and Riverside Municipal Airport (RAL).

Attachment 2

Equipment Inventory

Region	9
State	California
AQS ID	06-037-1103, Los Angeles (Main Street)
CBSA	31080 – Los Angeles-Long Beach-Anaheim

Parameter	Category	Detail
Site	Is the AQS site ID listed above the expected PAMS Core site location?	Yes
	What is the status of the decision for the expected PAMS Core site location (not started, draft, or final)?	Final
	Is there an alternate PAMS Core site location selected?	No
	Identify type of alternative site (existing PAMS, NATTS, etc.)	None
	Alternate site AQS ID (if known)	None
Mixing Height	Is there an existing functional ceilometer or other similar instrument available for use?	No, waiver requested for alternate location at LAX
	Current location (at future PAMS Core site, at other site, not applicable)	At LAX location.
	Instrument type (ceilometer, radar profiler, etc.)	Ceilometer, radar wind profiler
	Manufacturer	Vaisala
	Model	CL51
	Date purchased	4/2016
	Comments	LAX site ceilometer includes mixing height algorithm.
Auto GC	Is there an existing Auto GC available for use?	Yes
	Current location (at future PAMS Core site, at other site, not applicable)	At PAMS Core site
	Manufacturer	Agilent/Marques
	Model	7890A/Unity Air Server 2
	Date purchased	07/2015
	Does it have a service contract?	GC under warranty – establishing service contract.
	Comments	
True NO2	Is there an existing true NO2 instrument available for use?	In process of being purchased.
	Current location (at future PAMS Core site, at other site, not applicable)	To be installed at PAMS Core
	Instrument type (photolytic conversion, cavity ring down, CAPS, etc.)	CAPS
	Manufacturer	Teledyne
	Model	T500U
	Date purchased	In process
	Comments	
Carbonyls Sampling	Is there an existing sequential carbonyls sampling unit or similar instrument available for use?	Yes
	Current location (at future PAMS Core site, at other site, not applicable)	At Core PAMS site
	Manufacturer	ATEC
	Model	8000
	Date purchased	2017
	Comments	
	Does the site currently have a support laboratory for carbonyls or plans to use a support laboratory?	Samples to be analyzed at SCAQMD
Carbonyls Analysis	laboratory name	N/A
	comments	

Barometric Pressure	Instrument type (aneroid barometer, etc.)	Barometer, Electronic
	Manufacturer	Vaisala
	Model	PTB110
	Date purchased	9/27/13
	Comments	Equivalent sensor also at LAX Upper Air Station
UV Radiation	Instrument type (UV radiometer, etc.)	Total Ultraviolet Radiation
	Manufacturer	Eppley
	Model	TUVR
	Date purchased	3/6/08
	Comments	Equivalent sensor also at LAX Upper Air Station
Solar Radiation	Instrument type (Pyranometer, etc.)	Pyranometer
	Manufacturer	Kipp and Zonen
	Model	CMP6
	Date purchased	3/6/08
	Comments	Equivalent sensor also at LAX Upper Air Station
Precipitation	Instrument type (tipping bucket, weighing, etc.)	Electronic Gauge - Weighing
	Manufacturer	
	Model	
	Date purchased	
	Comments	NWS/FAA precipitation nearby at Downtown LA (USC)

Region	9
State	California
AQS ID	06-065-8001, Rubidoux
CBSA	40140 - Riverside-San Bernardino-Ontario

Parameter	Category	Detail
Site	Is the AQS site ID listed above the expected PAMS Core site location?	Yes
	What is the status of the decision for the expected PAMS Core site location (not started, draft, or final)?	Final
	Is there an alternate PAMS Core site location selected?	No
	Identify type of alternative site (existing PAMS, NATTS, etc.)	None
	Alternate site AQS ID (if known)	None
Mixing Height	Is there an existing functional ceilometer or other similar instrument available for use?	No, waiver requested for alternate location at ONT
	Current location (at future PAMS Core site, at other site, not applicable)	At ONT location.
	Instrument type (ceilometer, radar profiler, etc.)	Ceilometer, Radar Wind Profiler.
	Manufacturer	Vaisala
	Model	CL51
	Date purchased	1/2018
	Comments	ONT ceilometer includes mixing height algorithm.
Auto GC	Is there an existing Auto GC available for use?	Yes
	Current location (at future PAMS Core site, at other site, not applicable)	At PAMS Core site
	Manufacturer	Agilent/Marques
	Model	7890A/Unity Air Server 2
	Date purchased	04/2016
	Does it have a service contract?	GC under warranty – establishing service contract.
	Comments	
True NO2	Is there an existing true NO2 instrument available for use?	In process of being purchased.

	Current location (at future PAMS Core site, at other site, not applicable)	To be installed at PAMS Core
	Instrument type (photolytic conversion, cavity ring down, CAPS, etc.)	CAPS
	Manufacturer	Teledyne
	Model	T500U
	Date purchased	In process
	Comments	
Carbonyls Sampling	Is there an existing sequential carbonyls sampling unit or similar instrument available for use?	Yes
	Current location (at future PAMS Core site, at other site, not applicable)	At Core PAMS site
	Manufacturer	ATEC
	Model	8000
	Date purchased	2017
	Comments	
Carbonyls Analysis	Does the site currently have a support laboratory for carbonyls or plans to use a support laboratory?	Samples to be analyzed at SCAQMD
	Laboratory name	N/A
	Comments	
Barometric Pressure	Instrument type (aneroid barometer, etc.)	Barometer, Electronic
	Manufacturer	Vaisala
	Model	PTB110
	Date purchased	9/27/13
	Comments	Equivalent sensor also at ONT Upper Air Station
UV Radiation	Instrument type (UV radiometer, etc.)	Total Ultraviolet Radiation
	Manufacturer	Eppley
	Model	TUVR
	Date purchased	3/6/08
	Comments	Equivalent sensor also at ONT Upper Air Station
Solar Radiation	Instrument type (Pyranometer, etc.)	Pyranometer
	Manufacturer	Kipp and Zonen
	Model	CMP6
	Date purchased	3/6/08
	Comments	Equivalent sensor also at ONT Upper Air Station
Precipitation	Instrument type (tipping bucket, weighing, etc.)	Electronic Gauge - Weighing
	Manufacturer	
	Model	
	Date purchased	
	Comments	NWS/FAA precipitation nearby at ONT airport site